

CLAIMS

1. A signal processing device, comprising a first
digital signal processing block and a second digital signal
5 processing block, wherein:

the first digital signal processing block comprises:

first gain adjustment means to which a digital signal
subjected to predetermined digital signal processing is
input and from which the digital signal is output after a
10 gain according to a set gain value is given to the digital
signal; and

first digital to analog conversion means for converting
the digital signal output from the first gain adjustment
means to an analog signal and outputting the analog signal
15 from the first digital signal processing block,

the second digital signal processing block comprises:

analog to digital conversion means for converting the
analog signal output from the digital to analog conversion
means of the first digital signal processing block to a
20 digital signal;

digital signal processing means for subjecting the
digital signal output from the analog to digital conversion
means to predetermined digital signal processing;

second gain adjustment means to which the digital
25 signal output from the digital signal processing means is

input, from which the digital signal is output after a gain according to a set gain value is given to the signal, and to which gain sensitivity lower than that of the first gain adjustment means is set; and

5 second digital to analog conversion means for converting the digital signal output from the second gain adjustment means to an analog signal and outputting the analog signal from the second digital signal processing block,

10 the first digital to analog conversion means and the analog to digital conversion means are set such that a relation, in which the minimum value within the range of dispersion of the errors of the signal level in the first digital to analog conversion means is equal to or larger
15 than the maximum value within the range of dispersion of the errors of the signal level in the analog to digital conversion means, and

the signal processing device further comprises:

20 detection means for detecting the level value of the digital signal output from the second gain adjustment means;

first gain set means for setting a gain value to the first gain adjustment means such that the level value detected by the detection means is set to a maximum value within the range less than a prescribed value in a state that
25 a signal whose level is treated as a maximum value in the

first digital signal processing block is input to the first gain adjustment means; and

second gain set means for setting a gain value to the second gain adjustment means such that the level value
5 detected by the detection means is set to a maximum value within the range equal to or less than the prescribed value in a state that a signal whose level is treated as a predetermined maximum value is input to the first digital signal processing block after the gain value is set by the
10 first gain set means.

2. A signal processing device according to claim 1, wherein:

when the gain of the digital signal is changed, the
15 first gain set means inputs a signal whose level is treated as the predetermined maximum value to the first digital signal processing means as well as the gain value is set to the first gain set means such that the level value detected by the detection means is set to a maximum value within the
20 range less than the prescribed value in a state that the gain value is set to a maximum gain value in the digital signal processing means; and

the second gain set means inputs a signal whose level is treated as a predetermined maximum value to the first
25 digital signal processing block after a gain value is set by

the first gain set means as well as sets a gain value to the
second gain adjustment means such that the level value
detected by the detection means is set to a maximum value
within the range equal to or less than the prescribed value
5 in a state that the gain value is set to one time in the
digital signal processing means.

3. A signal processing method of executing first
digital signal processing and second digital signal
10 processing, wherein:

the first digital signal processing comprises:

a first gain adjustment procedure to which a digital
signal subjected to predetermined digital signal processing
is input and which gives a gain according to a set gain
15 value; and

a first digital to analog conversion procedure for
converting the digital signal obtained by the first gain
adjustment procedure to an analog signal and using the
analog signal as an output from the first digital signal
20 processing,

the second digital signal processing comprises:

an analog to digital conversion procedure for
converting the analog signal obtained by the digital to
analog conversion procedure included in the first digital
25 signal processing into a digital signal;

a digital signal processing procedure for subjecting the digital signal obtained by the analog to digital conversion procedure to predetermined digital signal processing;

5 a second gain adjustment procedure to which the digital signal obtained by the digital signal processing procedure is input and which gives a gain by gain sensitivity lower than the first gain adjustment procedure according to a set gain value; and

10 a second digital to analog conversion procedure for converting the digital signal obtained by the first gain adjustment procedure to an analog signal and outputting the analog signal from the second digital signal processing unit,

wherein the signal processing method further executes:

15 a set procedure for setting a such a relation that the minimum value within the range of dispersion of the errors of the signal level in a device corresponding to the first digital to analog conversion procedure is equal to or larger than the maximum value within the range of dispersion of the
20 errors of the signal level in a device corresponding to the analog to digital conversion procedure;

a detection procedure for detecting the level value of the digital signal obtained by the second gain adjustment procedure;

25 a first gain set procedure for setting a gain value to

the first gain adjustment procedure such that the level value detected by the detection procedure is set to a maximum value within the range less than a prescribed value in a state that a signal whose level is treated as a maximum value in the first digital signal processing is input to the first gain adjustment procedure; and

a second gain set means for setting a gain value to the second gain adjustment procedure such that the level value detected by the detection procedure is set to a maximum value within the range equal to or less than the prescribed value in a state that a signal whose level is treated as a predetermined maximum value is input to the first digital signal processing block after the gain value is set by the first gain set procedure.